REMARKS

In the Office Action, the Examiner rejected claims 32, 47, 58, and 67 for certain informalities. The Examiner also rejected claims 28-31, 34-36, 39-46, 49-51 and 54-57 under 35 U.S.C. § 102(e) as being anticipated by USP 5,822,214 issued to Rostoker et al (Rostoker). In this Amendment, Applicants have amended claims 28, 30, 32, 43, 45, 47, 58, and 67, but have not added or canceled any claims. Accordingly, claims 28-75 will be pending after entry of this Amendment.

I. Allowance of Claims 32, 33, 37, 38, 47, 48, 52, 53, and 58-75

In the Office Action, the Examiner found claims 32, 33, 37, 38, 47, 48, 52, 53, and 58-75 allowable. Applicants acknowledge and thank the Examiner for this finding.

II. Amendments to Claims 28, 30, 32, 43, 45, 47, 58, and 67

In the Office Action, the Examiner rejected claims 32 and 47 for lacking antecedent basis for the phrase "said slots" in these claims. In this Amendment, Applicants have changed "slots" to "sub-regions" in these claims. The Examiner also rejected claims 58 and 67 for failing to recite limitations that appear related to the pre-computation of costs for placing circuit modules, which was the subject matter recited in the preamble of these claims. In this Amendment, Applicants have amended these to recite that a placer will use the stored indicia (recited in these claims) to compute the cost of different placements. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 32, 47, 58, and 67.

In this Amendment, Applicants have also amended claims 28, 30, 43, and 45 to correct certain informalities in these claims. No new matter has been added by these amendments.

III. §102 Rejection

The Examiner rejected claims 28-31, 34-36, 39-46, 49-51 and 54-57 under § 102(e) as being anticipated by Rostoker.

A. Claims 28-31, 34-36, and 39-42

Claims 29-31, 34-36, and 39-42 are directly or indirectly dependent on independent claim 28. This claim recites a method of placing circuit modules in a region of an integrated circuit ("IC") layout that has several circuit elements, where several nets represent interconnections between the circuit elements and each net is defined to include a set of circuit elements. The method initially partitions the IC layout region into several sub-regions, where several edges exist between the sub-regions and several of the edges are diagonal. The method then selects a net. For the selected net, the method (1) identifies the set of sub-regions that contain the net's circuit elements, (2) identifies the edges intersected by at least one connection graph that represents a topology of one or more interconnect lines necessary for connecting the identified set of sub-regions, where at least one of the identified edges is diagonal, and (3) computes a placement cost by using the identified edges.

Applicants respectfully submit that Rostoker does not disclose, teach, or even suggest such a method. Specifically, Rostoker does not disclose, teach, or even suggest a method that:

- partitions an IC layout region into several sub-regions, so that several edges exist between the sub-regions and several of the edges are diagonal;
- for a net,
    - identifies the set of sub-regions containing the circuit elements of the selected net,
    - identifies the edges intersected by at least one connection graph that represents a topology of one or more interconnect lines necessary for connecting the identified set of sub-regions, where at least one of the identified edges is diagonal, and
    - computes a placement cost by using the identified edges.

If the Examiner believes that Rostoker discloses such a method, Applicants respectfully request that the Examiner identify precisely the above-recited limitations in Rostoker. For instance, Applicants respectfully request that the Examiner (1) identify the edges (including the diagonal edges) that exist between the sub-regions, (2) specify where Rostoker discusses identifying edges intersected by a connection graph representing the topology of interconnect lines that connect the set of sub-regions containing the net's circuit elements, and (3) specify how Rostoker computes a placement cost by using the identified edges.

For at least the above-described reasons, Applicants respectfully submit that Rostoker does not anticipate, or otherwise render invalid, claims 29-31, 34-36, and 39-42 as these claims are directly or indirectly dependent on independent claim 28. In addition, these claim are patentable over Rostoker as they recite numerous novel and non-obvious limitations. For instance, claim 39 recites that the method identifies the edges intersected by all optimal connection graphs for the selected net, and claim 40 recites that the connection graphs are determined to be optimal based on at least one particular selection criterion. Claims 41 and 42 then recite some of the selection criterion used in some embodiments of the invention. Applicants respectfully submit that Rostoker does not disclose, teach, or even suggest any of these limitations.

In view of the foregoing, Applicants respectfully request the reconsideration and withdrawal of the § 102 rejection of claims 28-31, 34-36, and 39-42.

B. Claims 43-46, 49-51, and 54-57

Claims 44-46, 49-51, and 54-57 are directly or indirectly dependent on independent claim 43. This claim recites a method of placing circuit modules in a region of an integrated circuit ("IC") layout that has several circuit elements, where several nets represent interconnections between the circuit elements and each net is defined to include a set of circuit

elements. The method initially partitions the IC layout region into several sub-regions, where several line paths exist between the sub-regions and several of the line paths are diagonal. The method then selects a net. For the selected net, the method then (1) identifies the set of sub-regions that contain the net's circuit elements, (2) identifies the line paths used by at least one connection graph that represents a topology of one or more interconnect lines necessary for connecting the identified set of sub-regions, where at least one of the identified line paths is diagonal, and (3) computes a placement cost by using the identified line paths.

Applicants respectfully submit that Rostoker does not disclose, teach, or even suggest such a method. Specifically, Rostoker does not disclose, teach, or even suggest a method that:

- partitions an IC layout region into several sub-regions, so that several line paths exist between the sub-regions and several of the line paths are diagonal;
- for a net,
    - identifies the set of sub-regions containing the circuit elements of the selected net,
    - identifies the line paths used by at least one connection graph that represents a topology of one or more interconnect lines necessary for connecting the identified set of sub-regions, where at least one of the identified line paths is diagonal, and
    - computes a placement cost by using the identified line paths.

If the Examiner believes that Rostoker discloses such a method, Applicants respectfully request that the Examiner identify precisely the above-recited limitations in Rostoker. For instance, Applicants respectfully request that the Examiner (1) identify the line paths (including the diagonal line paths) that exist between the sub-regions, (2) specify where Rostoker discusses

identifying line paths used by a connection graph representing the topology of interconnect lines that connect the set of sub-regions containing the net's circuit elements, and (3) specify how Rostoker computes a placement cost by using the identified line paths.

For at least the above-described reasons, Applicants respectfully submit that Rostoker does not anticipate, or otherwise render invalid, claims 44-46, 49-51, and 54-57 as these claims are directly or indirectly dependent on independent claim 43. In addition, these claim are patentable over Rostoker as they recite numerous novel and non-obvious limitations. For instance, claim 54 recites that the method identifies the line paths used by all optimal connection graphs for the selected net, and claim 55 recites that the connection graphs are determined to be optimal based on at least one particular selection criterion. Claims 56 and 57 then recite some of the selection criterion used in some embodiments of the invention. Applicants respectfully submit that Rostoker does not disclose, teach, or even suggest any of these limitations.

In view of the foregoing, Applicants respectfully request the reconsideration and withdrawal of the § 102 rejection of claims 43-46, 49-51, and 54-57.

IV. Information Disclosure Statement

Accompanying this Amendment are two 1449 forms of two Information Disclosure Statements that Applicants previously submitted. These forms list several related cases and additional references for the Examiner's consideration.

CONCLUSION

In view of the foregoing, it is submitted that the currently pending claims, namely claims 28-75, are in condition for allowance. Reconsideration of the rejections is requested. Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

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